

ABSTRACT

A method of thinning a silicon wafer in a controllable cost-effective manner with minimal chemical consumption. The wafer is placed into a process chamber, after which ozone gas and HF vapor are delivered into the process chamber to react with a silicon surface of the wafer. The ozone and HF vapor may be delivered sequentially, or may be mixed with one another before entering the process chamber. The ozone oxidizes the silicon surface of the wafer, while the HF vapor etches the oxidized silicon away from the wafer. The etched oxidized silicon is then removed from the process chamber. As a result, the wafer is thinned, which aids in preventing heat build-up in the wafer, and also makes the wafer easier to handle and cheaper to package. In alternative embodiments, HF may be delivered into the process chamber as an anhydrous gas or in aqueous form.